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**Summary:**

# **The role of distraction and inattention in crash involvement**

## **A survey among insurance company customers**

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*A survey on inattention and distraction among 3662 car drivers who had been involved in a crash, and a random sample of 345 car owners, showed that distraction was present in 26 % of crashes. Internal (cognitive) distraction, i.e., impaired concentration on the driving task due to daydreaming or concern about matters unrelated to the traffic situation, was present in about 12 % of crashes, and it was the distraction factor with the highest risk. Survey results confirm previous studies showing increased risk during telephoning while driving. Almost three percent of drivers write and send messages during driving, and 4.5 % read messages. There is also a significant risk increase associated with tuning a car radio, and with distraction factors outside the vehicle. The share of drivers having fallen asleep during the latest 12 months was 2.7 %, and 2.8 % of these incidents resulted in a crash.*

This report presents results from a survey about risk factors in road traffic, especially related to inattention and distraction. The survey was administered to 3662 crash-involved drivers and a random sample of 345 car owners. The questions comprised the following topics related to driver vigilance and safety:

- The role of mobile telephone use when driving
- Other sources of distraction inside and outside the vehicle
- Drowsiness and falling asleep at the wheel
- Interaction with other road users
- Driving behaviour and driving errors
- In-vehicle technical systems, and their role both as possible sources of distraction and as driver support to prevent distraction.

The driver samples were drawn among customers of the insurance company Gjensidige. The crash-involved drivers were drawn among customers who had reported a crash to the insurance company during the latest 12 months. The other sample was drawn randomly from among car insurance customers. Invitations to participate in the survey were sent out by the insurance company, and the invitation contained a link to a web survey. Customers who had reported a crash but had not been driving the vehicle during the crash were asked to forward the invitation to the driver of car.

The survey required each driver to report whether the insurance company had ascribed responsibility for the crash to the reporting driver or to another involved road user. Thus, the respondents could be divided into two groups, i.e., at-fault vs. not-at-fault drivers, where single-vehicle crashes by definition are at-fault crashes. This grouping was used for the purpose of comparing prevalence of each risk factor between at-fault and not-at-fault drivers, and computing relative risk ratios using the *quasi-induced exposure* method. This means that any factor with a higher prevalence

among at-fault than among not-at-fault drivers is interpreted as a risk factor. The risk is quantified in terms of odds ratio or a relative risk ratio, where a value above 1 means increased risk and a value below 1 means reduced risk.

## **Drowsiness and falling asleep at the wheel**

About one in four drivers had fallen asleep at the wheel some time, and 2.7 % (106 out of 3905 drivers) had done so during the latest 12 months. Out of these 106 incidents, there were 2.8 % resulting in a crash (2.4 % drove off the road and 0.4 % hit some other road user). The most frequent consequence was crossing the right-side edge-line before waking up – this occurred to 18 % of those who dozed off.

Both the share of drivers dozing off last year and the share of sleep incidents resulting in a crash were lower in this study than in similar previous studies. This could be an effect both of recent media focus on driver sleep and crashes, partly in conjunction with campaign, as well as increased use of profiled centre- and edge-lines (rumble strips). Among those who had dozed off, 11.5 % reported that they had been awoken by rumble strips.

Almost one in three drivers say they sometimes drive even though feeling too tired, and the most frequent reason (given by 688 out of 1132 drivers) is that there is no alternative transport available.

## **Mobile telephoning**

About 55 % of the drivers use their mobile telephone during driving. About one-third report using a hand-held telephone, and among these drivers about 15 % report that they never stop the vehicle when they use the phone.

Among drivers using the telephone while driving, almost 3 % report that they in addition to making or receiving calls write and send messages daily, and 4.5 % read messages while driving. As many as 30 % send messages and 50 % read messages occasionally.

Regarding perceived consequences of telephoning while driving, we found that:

- 92 % are less attentive to traffic when writing or reading messages (53 % ‘somewhat’, 29 % ‘much’, and 10 % ‘very much’ less attentive)
- 19 % have experienced dangerous situations due to their own use of a telephone while driving, and
- 71 % have experienced dangerous situations due to other drivers using a telephone.

Out of the 3572 drivers who had reported a crash, 21 had used a mobile phone during the crash; 12 had used a handheld phone (which is explicitly forbidden by law). Twelve crashes occurred during the conversation phase (5 outgoing and 7 incoming calls). Two drivers were reading or writing a message when the crash occurred, and three drivers were dialling. The remaining four crashes occurred while the driver was putting away the phone, searching for information, or using other telephone functions. It should be noted that in all crashes that did not occur during conversation the driver was at fault for the crash, whereas other road users were at fault in four out of the crashes during conversation.

Using a telephone during the crash is associated with an odds ratio of between 3.2 and 3.3 for being at fault of the crash, which implies that telephoning increases the

risk increases by more than three times compared to driving under the same conditions without using the phone. This estimate is the combined effect of all uses of the phone, i.e., dialling, messaging, and conversation.

## Inattention and distraction

Figure S-1 shows the prevalence of distraction factors immediately before the crash for at-fault and not-at-fault drivers. Some of these distractions or other was present in 26.2 % of crashes. A high prevalence does not necessarily mean high risk. Factors occurring frequently during driving also are more likely to be present in a crash. However, *the ratio of prevalence between at-fault and not-at-fault drivers* is an indication of the relative risk associated with a factor. Thus, conversation with a passenger does not seem to be a risk factor in this study, although having a high prevalence.

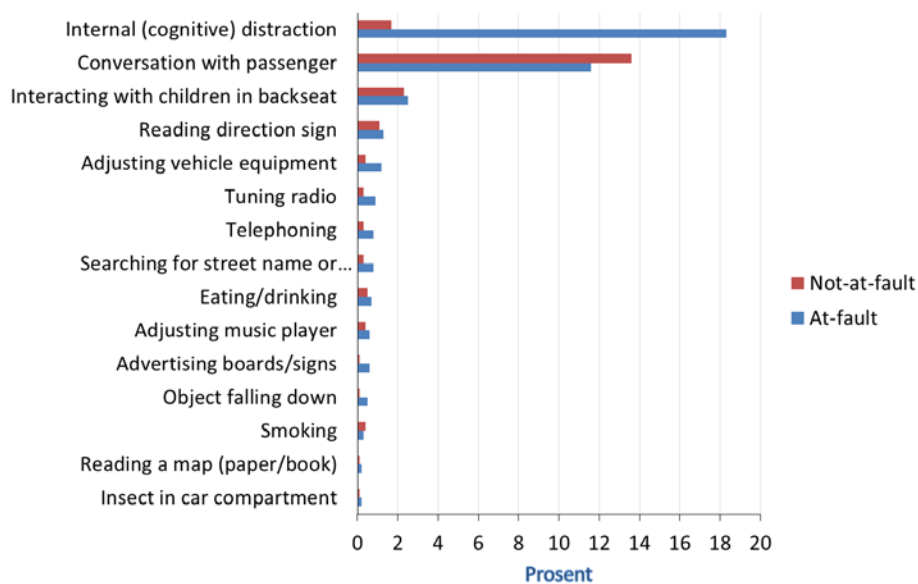


Figure S-1. Crash-involved drivers reporting presence of specific sources of distraction immediately preceding the crash, by being at fault or not. Percent.

Figure S-1 shows that the most prevalent distraction factor in crashes is internal (or cognitive) distraction; i.e., daydreaming or being preoccupied with concerns, feelings or thoughts about matters unrelated to the driving situation. This means that the source of the distraction is within the person, as opposed to distraction by factors outside the person. This is also the factor with the highest relative risk, yielding an odds ratio of more than 15. There is also a significant odds ratio for unspecified distraction outside the vehicle; which may possible include advertising boards or signs. Among more specific in-vehicle sources of distraction in addition to telephoning, only radio tuning showed a significant relationship to being at fault of the crash.

## Driver behaviour

Drivers were asked about use of observational strategies used for deciding whether or not to yield to a vehicle coming on a minor road from the right. There were significant effects for paying attention to the speed of the other vehicle and for

considering whether the other driver was male or female. Drivers using these strategies had lower odds for being at fault for a crash.

It is further notable that there is a reduced risk among drivers reporting that they have been flashed at by the headlights of a following vehicle. This can possibly be explained by these drivers driving slowly, and therefore being less likely to get involved in crashes.

We find that interest in cars and driving is higher among not-at-fault drivers. This may possible reflect a positive interest in driving, which may also include safety consciousness.

## **Vehicle characteristics and equipment**

Drivers of older cars have lower odds for being at fault of the crash. This is possibly partly due to lower driving speeds, since older cars may be less comfortable. We also find that drivers of SUVs have a higher risk than drivers of other passenger cars. There are indications that SUVs tend to be driven at higher speeds, which may be related to a reduced speed perception partly due to a high seating position of the driver. Furthermore, SUVs have a high centre of gravity and may therefore have a higher risk of roll-over crash.

A separate analysis of crashes during backing showed reduced incidence of such crashes among vehicles with backing sensors, indicating a favourable effect of this driver support system

## **Background factors**

Drivers above 70 years of age are twice as likely to be at fault of a crash as drivers aged between 30 and 69 years. Surprisingly, for the youngest age group we do not find a significantly increased odds rate for being at fault; but this may be due to a low number of young drivers in the sample. Male drivers have significantly higher odds of being at fault than females, and drivers living in rural areas have higher odds than those living in urban areas.

## **Conclusions**

We conclude that the following stand out as most important among the risk factors investigated in this study:

- Internal distraction (daydreaming, etc.)
- Advertising signs and boards
- Radio tuning
- Telephoning

These four factors have a relative risk above 3.0, which means that the risk is more than three times the risk when driving in the absence of these factors. In addition there are several factors with lower relative risks that are also statistically significant. Most of these have relative risks below 2.0.